S
388.11
H3ec

ENGINEERING REPORT

STATE DOCUMENTS

COMPARING

ALTERNATE LOCATIONS

INTERSTATE ROUTE 15

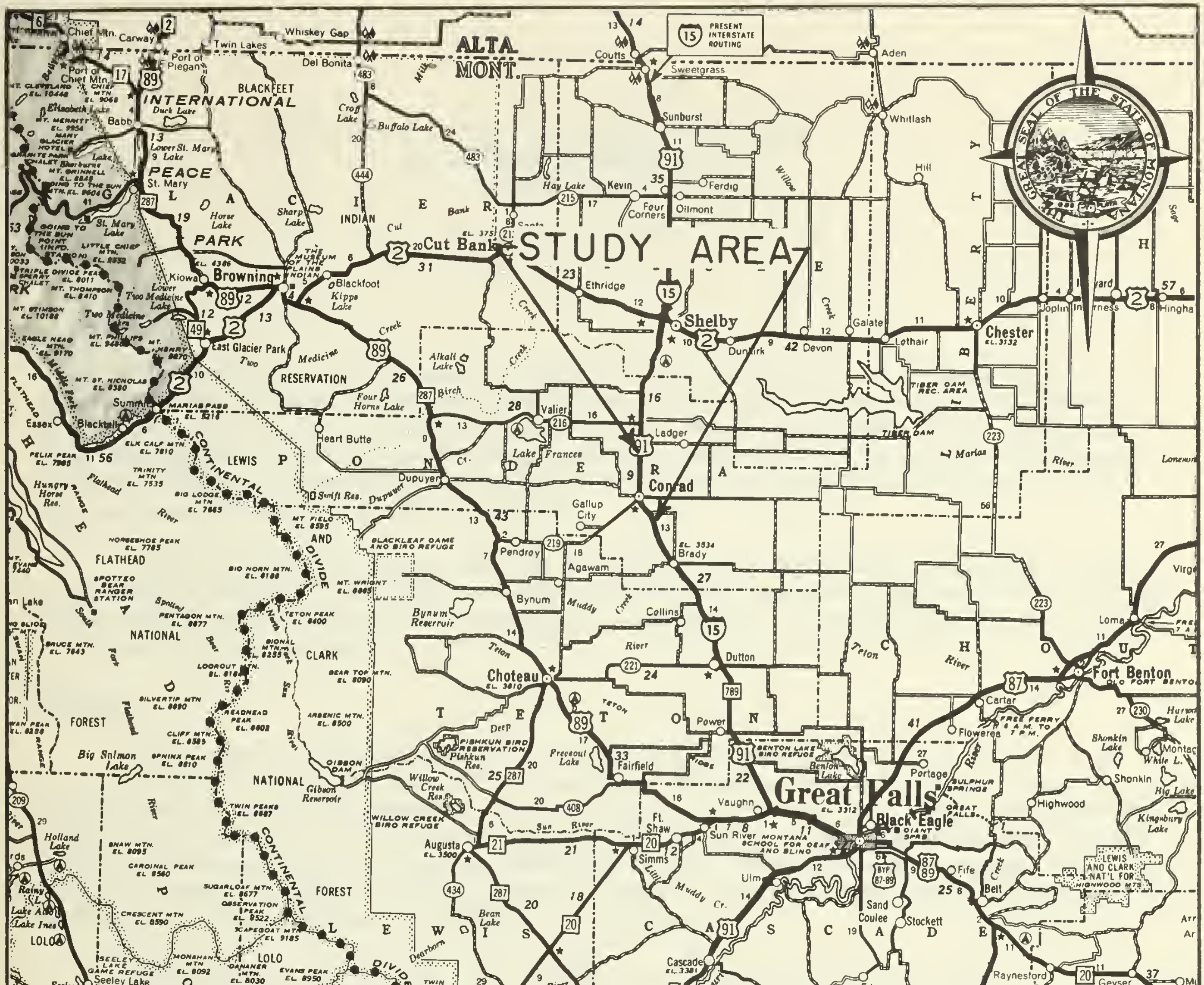
CONRAD N.&S.

PREPARED BY
MONTANA STATE HIGHWAY COMMISSION
INTERSTATE DIVISION

MONTANA STATE LIBRARY
930 East Lyndale Avenue
Helena, Montana 59601

411.1

Montana State Library
3 0864 1006 2277 1



SITUATION MAP

Digitized by the Internet Archive
in 2013

http://archive.org/details/engineeringrepor00mont

ENGINEERING REPORT FOR COMPARISON OF COSTS
ON INTERSTATE ROUTE 15
CONRAD N & S

October 19, 1964

FOREWORD

An analysis of this type is prepared for the purpose of presenting factual data which may be used in determining the most favorable highway location where more than one location is under consideration. The factors taken into consideration include the cost of constructing each alternate (including right-of-way costs), the cost of maintaining each alternate and the cost that will be incurred by the highway user in traveling each alternate.

One other factor which must be considered when selecting a highway location, but which is very difficult to evaluate on a dollars and cents basis is the economic effect which each alternate will have on the community or region through or near which the highway passes.

GENERAL

This report compares the relative merits of alternate locations for I 15 in the vicinity of Conrad, Montana. The southern terminus for this study is approximately 5 miles south of Conrad at the north end of the recently completed Brady N & S Interstate project, while the northern terminus is a point approximately 4 miles north of Conrad and ½ mile east of existing US 91. The proposed location for I 15 from this point northerly approximately 11 miles to the Pondera-Toole County Line is discussed in the supplement attached to this report.

Alternates included in this report are designated "A" thru "F".

DESCRIPTION OF ALTERNATES

Alternate "A"

Beginning at the north end of the Brady N & S project, Alternate "A" would proceed northwesterly to Midway Road where an interchange (local road over) would be provided. From Midway Road Alternate "A" would continue northwesterly to the southeast outskirts of Conrad where an interchange (local road over) would be provided at an extension of 4th Avenue. From the 4th Avenue extension the alternate would proceed northerly, cross the Great Northern Railway's spur track east of Conrad and then proceed northerwesterly to a crossing of the Great Northern Railway's main line near the Conrad ball park. In this area another interchange would be provided to connect to a northerly extension of Main Street (US 91). Alternate "A" would then continue northerly, cross the Montana Western Railway, cross the Dry Fork of the Marias River and end at the northern terminus approximately 4 miles north of Conrad and ½ mile east of US 91.

Alternate "B"

From the north end of the Brady N & S project to the north interchange near the Conrad ball park Alternate "B" would be the same as Alternate "A". From this point northward Alternate "B" would be east of Alternate "A" and cross the Great Northern Railway's main line twice in lieu of crossing the Montana Western Railway once as would Alternate "A". The two crossings of the Great Northern Railway's main line on Alternate "B" would be practically right angle crossings, whereas the crossing of the Montana Western Railway on Alternate "A" would have a severe skew. This situation results in similar structure costs for both alternates.

Alternate "C"

From the north end of the Brady N & S project to the crossing of the Great Northern Railway's spur track east of Conrad Alternate "C" would be the same as Alternates "A" and "B". From this point northward Alternate "C" would not cross the Great Northern Railway's mainline near the Conrad ball park as would Alternates "A" and "B", but would have the north interchange across the track from the ball park with the connection to Main Street crossing the track at grade. From the north interchange Alternate "C" would proceed northeasterly, paralleling the Great Northern Railway to near the Conrad sewer lagoons where a relocation of the Great Northern Railway's mainline would be required. From the sewer lagoons Alternate "C" would proceed northerly, cross the Great Northern Railway, cross the Dry Form of the Marias River and end at the same northern terminus as the other alternates.

Alternate "D"

Beginning at the north end of the Brady N & S project, Alternate "D" would proceed northwesterly to Midway Road where an interchange (local road over) would be provided. (At the Midway Road Alternate "D" would be approximately 2000 feet east of Alternates "A", "B", and "C"). From Midway Road Alternate "D" would continue northwesterly to an interchange (local road over) at Solid Road, approximately 0.7 miles east of Conrad's Main Street. ("Solid Road" is the local terminology for FAS 218). From the interchange at Solid Road Alternate "D" would proceed northeasterly to near the Conrad sewer lagoons where a relocation of the Great Northern Railway's mainline would be required. From the sewer lagoons to the northern terminus Alternate "D" would be the same as Alternate "C".

Alternate "E"

From the north end of the Brady N & S project to the Midway Road Interchange Alternate "E" would be the same as Alternates "A", "B", and "C". From Midway Road Alternate "E" would proceed northwesterly to a point approximately 1 mile east of the south City limits of Conrad where an interchange (local road over) would be provided. This interchange would require a connection approximately 1 mile long between the Interstate and the south end of Conrad's Main Street. Alternate "E" would then proceed northwesterly, cross Solid Road and then the Great Northern Railway's spur track, cross the Great Northern Railway's mainline and have another interchange (local road over) just north of the Conrad ball park. From this interchange to the northern terminus Alternate "F" would be the same as Alternate "B"; however, it could just as easily follow the alignment of Alternate "A" in this area.

Alternate "F"

From the north end of the Brady N & S project to just south of Solid Road Alternate "F" would be the same as Alternate "D". From this area Alternate "F" would continue northwesterly, cross Solid Road (a local road over type separation would be provided at Solid Road), cross the Great Northern Railway's mainline and have a directional type interchange just north of the Conrad ball park. From this interchange to the northern terminus Alternate "F" would be the same as Alternate "B"; however, like Alternate "E" it could just as easily follow the alignment of Alternate "A" in this area. It should be noted that the north interchange for Alternate "F" is a directional type, while the north interchange for Alternate "E" is a diamond type; however, either type interchange could be provided on either alternate.

ADVANTAGES AND DISADVANTAGES

Alternate "A":

Provides direct access to Conrad from the north without crossing any tracks at-grade.

Provides fair access to Conrad from the south via 4th Avenue, although 4th Avenue crosses the Great Northern Railway at-grade.

Is one of the more costly alternates.

Is one of the longer alternates for thru traffic.

Has one of the poorer alignments.

Has three railway crossings.

Would probably be acceptable to the City of Conrad.

Alternate "B":

Provides direct access to Conrad from the north without crossing any tracks at-grade.

Provides fair access to Conrad from the south via 4th Avenue, although 4th Avenue crosses the Great Northern Railway at-grade.

Is one of the more costly alternates.

Is one of the longer alternates for thru traffic.

Has four railway crossings.

Would probably be acceptable to the City of Conrad.

Alternate "C":

Provides fair access to Conrad from the north although the north connection crosses the Great Northern Railway at-grade.

Provides fair access to Conrad from the south via 4th Avenue, although 4th Avenue crosses the Great Northern Railway at-grade.

Is one of the less costly alternates.

Is one of the longer alternates for thru traffic.
Has one of the poorer alignments.
Has two railway crossings and one railway relocation.

Would probably not be acceptable to the City of Conrad

Alternate "D":

Provides poor access to Conrad from both the north and the south as the Conrad Interchange is located 0.7 miles east of Conrad's Main Street on Solid Road (FAS 218) and all traffic in and out of Conrad would cross the Great Northern Railway at-grade.

Is the least costly alternate.

Is one of the shorter alternates for thru traffic.

Has one of the better alignments.

Has no undesirable features from an operational standpoint except the connection to Conrad.

Has one railway crossing and one railway relocation.

Would probably not be acceptable to the City of Conrad.

Alternate "E":

Provides good access to Conrad from the north without crossing any tracks at-grade.

Provides poor access to Conrad from the south as the south interchange is nearly 1 mile from town and the connection crosses the Great Northern Railway at-grade.

Is one of the more costly alternates.

Is one of the shorter alternates for thru traffic.

Has one of the better alignments.

Has no undesirable features from an operational standpoint except for the south connection to Conrad.

Has four railway crossings.

Would probably be acceptable to the City of Conrad.

Alternate "F":

Provides direct access to Conrad from the north without crossing any tracks at-grade.

Provides poor access to Conrad from the south as traffic must use either the Midway Road Interchange and US 91 or the north interchange.

Is one of the more costly alternates.

Is one of the shorter alternates for thru traffic.

Has one of the better alignments.

Has no undesirable features from an operational standpoint except for access to Conrad from the south.

Would probably be acceptable to the City of Conrad.

GENERAL COMMENTS:

Conrad Sewer Lagoons

The Conrad sewer lagoons are located approximately 2 miles northeast of Conrad just east of a sharp curve on the Great Northern Railway. Although both Alternates "C" and "D" would require a short relocation of the Great Northern Railway to avoid them, the lagoons would not be disturbed by any alternate under consideration.

Great Northern Railway Spur Track

Near the north edge of Conrad the Great Northern Railway has a spur track which branches off of the mainline and extends easterly approximately ½ mile. Alternates "A", "B", "C" and "E" include separations over this spur. The Great Northern Railway has indicated that the entire spur track is in continuous use both for car storage and as a turn around track. If this spur could be removed or shortened to approximately half its present length the construction costs would be reduced approximately $150,000 for Alternates "A", "B", and "C" and approximately $70,000 for Alternate "E". However, the Great Northern Railway has indicated they will not consider removing the spur track or shortening it this much.

Public Hearing

On May 19, 1964, a public hearing was held in Conrad to discuss the routing of I 15 from the north end of the Brady N & S project to the Pondera-Toole County Line. At that time Alternates "A" thru "E" had been developed. As Alternate "D" appeared to be the most favorable it was presented at the hearing with the other alternates being discussed briefly. The Conrad business community objected quite strongly to Alternate "D" as it would not provide a connection on the north. Following the public hearing Alternate "F" was developed in an effort to provide a lower cost alternate which would have a good north connection.

SUMMARY

The following tables ("A" thru "F") show the estimated construction costs for the alternates studied. As shown by the tables the estimated construction costs range from a low of $3,345,000 for Alternate "D" to a high of $4,831,000 for Alternate "E".

Following the construction cost estimates is an analysis of the traffic service provided by the alternates studied.

Following the traffic analysis is Table "G" which is a summary of the annual construction and operating costs. The figures in this table were developed on the basis of present traffic as was the traffic analysis. Normally, maintenance costs are included in a summary of this type; however, in this study they are not shown as they would be practically the same for all alternates considered. As shown in Table "G", Alternate "D" appears to be the most favorable because of its low initial cost.

Following Table "G" is Table "H" which is a summary similar to Table "G", only with the operating costs adjusted to reflect the anticipated average traffic for the next 20 years. As shown in Table "H", Alternate "B" appears to be the most favorable because of its lower operating costs.

Following Table "H" are sketch maps showing the alternates discussed in this report.

RECOMMENDATIONS

As Alternate "B" has the lowest estimated annual construction and operating costs for the next 20 years, it is recommended that it be adopted for design and construction.

CONRAD N & S
9.09 Miles - 4-lane - 70' centers

CONSTRUCTION COST ESTIMATE ALTERNATE "A"

ITEM	UNIT	Dollars
Grading	2,625,000 Cu. Yds. @ $.40	$1,050,000
Minor Drain & Irrigation	9.09 miles @ $15,000	136,000
Dbl. 15-4S X 10-4 R Dr.	320 Ft. @ $120 X 2	77,000
Base & Surface	9.09 miles @ $150,000	1,364,000
Base & Surface Interchanges	Lump Sum	120,000
Structures	Lump Sum	944,000
4th Avenue Extension	Lump Sum	40,000
North Connection	Lump Sum	20,000
Frontage Road	3.5 miles @ $15,000	52,000
Signing	Lump Sum	25,000
Fencing	18.18 miles @ $2,500	45,000
Guardrail	3 miles @ $17,000	51,000
Seed & Mulch	9.09 miles @ $3,000	27,000
SUBTOTAL		$ 3,951,000
Right-of-Way & Utilities	Lump Sum	206,000
Engineering & Contingencies (15% of Subtotal)		593,000
TOTAL		$ 4,750,000

6% - 35 yr. CRF = .0690

Annual Construction Cost = $327,750

TABLE "A"

CONRAD N & S
9.06 Miles - 4-lane - 70' centers

CONSTRUCTION COST ESTIMATE — ALTERNATE "B"

ITEM	UNIT	Dollars
Grading	2,525,000 Cu. Yds. @ $.40	$ 1,010,000
Minor Drainage & Irrigation	9.06 miles @ $15,000	136,000
Dbl. 15-4S X 10-4 R dr.	320 Ft. @ $120 X 2	77,000
Base & Surf.	9.06 miles @ $150,000	1,359,000
Base & Surf. Interchanges	Lump Sum	120,000
Structures	Lump Sum	983,000
4th Avenue Extension	Lump Sum	40,000
North Connection	Lump Sum	20,000
Frontage Road	1.4 miles @ $15,000	21,000
Signing	Lump Sum	25,000
Fencing	18.12 miles @ $2,500	45,000
Guardrail	3 miles @ $17,000	51,000
Seed & Mulch	9.06 miles @ $3,000	27,000
SUBTOTAL		$ 3,914,000
Right-of-Way Utilities	Lump Sum	246,000
Engineering & Contingencies (15% of Subtotal)		587,000
TOTAL		$ 4,747,000

6% - 35 Yr. CRF = .0690

Annual Construction Cost = $327,543

TABLE "B"

CONRAD N & S
9.23 Miles - 4-lane - 70' centers

CONSTRUCTION COST ESTIMATE

ALTERNATE "C"

ITEM	UNIT	Dollars
Grading	2,425,000 Cu. Yds. @ $.40	$ 970,000
Minor Dr. & Irr.	9.23 Miles @ $15,000	138,000
Dbl. 15-4S X 10-4 R dr.	320 Ft. @ $120 X 2	77,000
Base & Surf.	9.23 miles @ $150,000	1,384,000
Base & Surf. Interchanges	Lump Sum	120,000
Structures	Lump Sum	732,000
4th Avenue Extension	Lump Sum	40,000
North Connection	Lump Sum	20,000
Frontage Road	1.2 miles @ $15,000	18,000
Railway Relocation	Lump Sum	35,000
Signing	Lump Sum	25,000
Fencing	18.46 miles @ $2,500	46,000
Guardrail	3 miles @ $17,000	51,000
Seed & Mulch	9.23 Miles @ $3,000	28,000
SUBTOTAL		$ 3,684,000
Right-of-Way & Utilities	Lump Sum	162,000
Engineering & Contingencies (15% of Subtotal)		553,000
TOTAL		$ 4,399.000

6% - 35 yr. CRF = .0690

Annual Construction Cost = $ 303,531

TABLE "C"

CONRAD N & S
8.85 miles - 4-lane - 70' centers

CONSTRUCTION COST ESTIMATE ALTERNATE "D"

ITEM	UNIT	Dollars
Grading	1,400,000 Cu. Yds. @ $.40	$ 560,000
Minor Dr. & Irr.	8.85 miles @ $15,000	133,000
Dbl. 15-4S X 10-4 R Dr.	210 ft. @ $120 X 2	50,000
Base & Surf.	8.85 miles @ $150,000	1,328,000
Base & Surf. Interchanges	Lump Sum	80,000
Structures	Lump Sum	477,000
Frontage Road	1.3 miles @ $15,000	20,000
Railway Relocation	Lump Sum	35,000
Signing	Lump Sum	25,000
Fencing	17.7 miles @ $2,500	44,000
Guardrail	2 miles @ $17,000	34,000
Seed & Mulch	8.85 miles @ $3,000	27,000
SUBTOTAL		$ 2,813,000
Right-of-Way & Utilities	Lump Sum	110,000
Engineering & Contingencies (15% of Subtotal)		422,000
TOTAL		$ 3,345,000

6% - 35 yr. CRF = .0690

Annual Construction Cost = $230,805

TABLE "D"

CONRAD N & S
8.88 miles - 4-lane - 70' centers

CONSTRUCTION COST ESTIMATE

ALTERNATE "E"

ITEM		Dollars
Grading	$2,400,000 Cu. Yds. @ $.40	$ 960,000
Minor Dr. & Irr.	8.88 miles @ $15,000	133,000
Dbl. 15-4S X 10-4R Dr.	210 @ $120 X 2	50,000
Base & Surf.	8.88 miles @ $150,000	1,332,000
Base & Surf. Interchanges	Lump Sum	120,000
Structures	Lump Sum	1,150,000
South Connection	Lump Sum	50,000
FAS 218 Relocation	Lump Sum	10,000
Frontage Road	0.3 miles @ $15,000	4,000
Signing	Lump Sum	35,000
Fencing	17.76 miles @ $2,500	44,000
Guardrail	3 miles @ $17,000	51,000
Seed & Mulch	8.88 miles @ $3,000	27,000
SUBTOTAL		$3,966,000
Right-of-Way & Utilities	Lump Sum	270,000
Engineering & Contingencies (15% of Subtotal)		595,000
TOTAL		$4,831,000

6% - 35 yr. CRF = .0690

Annual Construction Cost = $333,339

TABLE "E"

[illegible]

CONRAD N & S
8.82 miles - 4-lane - 70' centers

CONSTRUCTION COST ESTIMATE

ALTERNATE "F"

ITEM	UNIT	Dollars
Grading	1,900,000 Cu. Yds. @ $.40	$ 760,000
Minor Dr. & Irr.	8.82 miles @ $15,000	132,000
Dbl. 15-4S X 10-4 R Dr.	210 ft. @ $120 X 2	50,000
Base & Surface	8.82 miles @ $150,000	1,323,000
Base & Surface Interchanges	Lump Sum	80,000
Base & Surface Solid Road	Lump Sum	10,000
Structures	Lump Sum	911,000
Frontage Road	1.3 miles @ $15,000	20,000
Signing	Lump Sum	25,000
Fencing	17.64 miles @ $2,500	44,000
Guardrail	2 miles @ $17,000	34,000
Seed & Mulch	8.82 miles @ $3,000	26,000
SUBTOTAL		$3,415,000
Right-of-Way & Utilities	Lump Sum	212,000
Engineering & Contingencies (15% of Subtotal)		512,000
TOTAL		$4,139,000

6% - 35 yr. CRF = .0690

Annual Construction Cost = $285,591

TABLE "F"

ANALYSIS OF TRAFFIC SERVICE PROVIDED BY ALTERNATE LOCATIONS FOR INTERSTATE ROUTE 15 IN THE VICINITY OF CONRAD

Alternate Lines A, B, C, D, E and F for Interstate Route 15 have been described previously in connection with the construction phases of this report, but for the benefit of the traffic analysis, it will be necessary to repeat some of the descriptive data.

From the standpoint of traffic service, Lines A, B and C provide essentially the same type of service from the common point at the southern terminus to the location of the interchange a short distance north of Conrad. These three routes provide for interchanges at points near the east city limits on the extension of Fourth Avenue. The interchange at this location will permit access to the city from the Interstate highway for traffic with origins and destinations, primarily to the south and to the west of the city.

Provision is also made for another interchange near the north city limits for all movement.

Beyond the north interchange, Lines A, B, and C follow separate locations as shown on the enclosed map. Line B is the shortest route, being about 0.032 mile shorter than Line A and 0.165 mile shorter than Line C.

Line D provides for a single interchange to provide access to the city in place of the two interchanges planned for Lines A, B and C. This interchange is located at the intersection with FAS Route 218 at a point about one-half mile east of the city limits. Line D is also located farther east of the city, and being the most direct line between termini, it is somewhat shorter than any of the other alternate routes.

Line E represents an intermediate location, and it provides for two interchanges. The south interchange is located at a point about one mile south of the proposed interchange on Line D and about 1.3 miles east of present U.S. No. 91. Being an interchange, it will serve movements in any direction from the city.

Another interchange on Line E is planned at a point about 0.8 mile north of the city limits and a short distance of U.S. No. 91. This interchange will also provide full service for traffic movements in any direction.

At a public hearing, which was held in Conrad on May 19, 1964, a number of local residents recommended that the proposed interchange on FAS Route 218 for Line D be changed to a location at the north edge of the city and west of the railroad tracks. Since this would involve a change in highway routings, Line F was established and analyzed to conform to this recommendation.

Line F would follow the same location as Line D from the south terminus to the point of intersection with FAS Route 218. In place of the interchange at this point, as proposed for Line D, a separation structure would be provided, and the line would then veer in a northwesterly direction to connect with the proposed interchange at the north edge of the city. The northward extension of Line D would then follow quite closely the location proposed for Line B which would generally follow the midsection line. A full-diamond interchange is proposed for Line F north of the city.

The following describes some of the salient features of the alternate routes as they pertain to traffic service:

1. In the effort to locate Lines A, B, and C as close as possible to the City of Conrad, it has been necessary to increase the length of these routes over Lines D and E. This has the effect of increasing the travel distance for the through, nonstop traffic; however, it provides a benefit of more usage of the Interstate highway and less usage of other types of facilities for those trips having origins or destinations in the City.

2. By providing for two interchanges on Lines A, B, and C, direct access to the City is afforded to all motorists. Dual interchange service also provides an opportunity for a "loop movement" through the City for the through traffic that wishes to stop in the City for some reason.

3. Line D is the shortest route of the five, and consequently, it would be of greatest benefit for the through, nonstop traffic. It would have the disadvantage of being located farthest from the City, and this would increase the amount of travel on other then Interstate highway facilities for the traffic with origins, destinations or stops in the City.

4. The single interchange, provided for Line D, would reduce the flexibility of movement as compared with dual interchanges, and it would produce a minor amount of extra travel distance for trips having origins or destinations in the southern half of the City and using the Interstate highway to the south of the City.

5. Line E is the second shortest route, being about 0.039 mile longer than Line D. The shorter travel distance, as compared with Lines A, B, and C, would be of benefit to the through, nonstop trips, but there would also be the disadvantage, as mentioned for Line D, that trips entering the City would also involve lesser usage of the Interstate highway and greater usage of other types of facilities.

6. Line E would have the advantage of two full-diamond interchanges with the flexibility of service and access that such interchanges would provide. This advantage would be offset to some extent by the fact that these interchanges are so located that considerable extra travel distance would be required of trips entering or leaving the City and a substantial portion of this travel would be through the congested portion of the City on facilities not offering the the advantages of the Interstate highway.

7. By placing the interchange north of the City for Line F, better access to the City would be provided for traffic to and from the north. This location would also overcome the objection to the

> proposed interchange site for Line D which would require traffic entering and leaving the City to cross the railroad tracks with the possibility of extensive delays because of train movements.
>
> It would have the disadvantage, however, that traffic moving to and from the south would either have to back-track some distance to reach the interchange north of the City and the Interstate highway or travel greater distances over the old highway to gain access to the Interstate highway through the interchange at the Midway Road.

The analysis of traffic service provided by the alternate routes was made on the basis of information obtained furing an origin-destination survey made in the vicinity of Conrad in 1959. During the course of this survey, traffic was interviewed at stations on the present highway near the north and south city limits.

This survey showed that there were 2,345 trips per day of traffic passing these two interview stations. Of this amount, 612 trips, or 26% of the total, passed through the City without stopping for any purpose. The remaining 1,733 trips, or 74% of the total, either had trip origins or destinations in the City, or stopped as part of the passage through the City.

The analysis of traffic service provided by each route was made by studying each type of trip and determining the routing and travel distance via the alternate facilities available. Several trips, particularly those with origins and destinations in the immediate vicinity of the City, would not have an opportunity to use any of the Interstate highways, and consequently they would continue to use the present facilities. Other trips of longer length would find it advantageous to use Interstate highway facilities as much as possible, but many of these trips would have occasion to use present facilities for part of the travel. The through, non-stop trips could be assigned almost entirely to usage of the Interstate highway facilities for all alternate routes.

The actual assignment of traffic to the different highway facilities available was made on the basis of accessibility to the Interstate highways, relative travel times involved by alternate facilities, the relative lengths of the trips involved and the attractiveness of each facility.

The enclosed table shows the results of the traffic assignment process as expressed in annual vehicle-miles of travel involved for each facility and in total, the average trip length on each facility and the total annual cost of vehicle operation as computed by multiplying the vehicle-miles of travel by the unit cost figure per vehicle mile based on 81% passenger cars and 19% trucks in the traffic stream. It should be noted that the cost of vehicle operation has been computed from the 1959 traffic flow and origin-destination data, with upward adjustment being made to equal the 1963 traffic flow as determined from the latest counts. It is of interest to observe that traffic during 1963 increased by about 34% over the 1959 counts.

From this table, it is evident that Line B has the lowest cost for vehicle operation, followed by Line A, Line C, Line E, Line D, and Line F in the order of increasing cost figures.

amount of difference in the relative vehicle operating cost figures. Line F, which has the highest cost, is only 3.54% greater than Line B with the lowest cost figures.

The traffic assignment process does not have the degree of accuracy which would provide conclusive support for any of the lines, considering the minor differentials involved. For this reason, it may be assumed that any of the alternate locations for Interstate Route 15 would be acceptable from the standpoint of traffic service.

COMPARISON OF VEHICLE OPERATING COST FIGURES

LINE A	PRIMARY HIGHWAYS $.1475/VM	CITY STREETS $.1900/VM	INTERCHANGE CONNECTIONS $.1405/VM	INTERSTATE HIGHWAYS $.1316/VM	COMBINED FACILITIES
Average trip length (miles)	2.080	0.505	0.579	13.712	12.903
Annual vehicle-miles of travel	1,384,139	329,190	367,999	12,745,667	14,826,995
Annual vehicle operating cost	$204,161	$62,546	$51,704	$1,677,330	$1,995,741
LINE B					
Annual trip length (miles)	1.977	0.497	0.577	13.623	12.876
Annual vehicle-miles of travel	1,315,880	324,144	371,527	12,783,838	14,795,389
Annual vehicle operating cost	$194,092	$61,587	$52,200	$1,682,353	$1,990,232
LINE C					
Average trip length (miles)	2.263	0.504	0.584	13.942	13.000
Annual vehicle-miles of travel	1,506,102	328,750	361,727	12,741,159	14,937,738
Annual vehicle operating cost	$222,150	$62,463	$50,823	$1,676,737	$2,012,173
LINE D					
Annual trip length (miles)	3.819	0.414	0.840	14.217	13.174
Annual vehicle-miles of travel	1,547,508	239,666	511,427	12,839,454	15,138,055
Annual vehicle operating cost	$228,257	$45,537	$71,855	$1,689,672	$2,035,321
LINE E					
Average trip length (miles)	1.982	0.537	0.592	13.231	13.035
Annual vehicle-miles of travel	1,721,954	459,338	381,279	12,415,496	14,978,067
Annual vehicle operating cost	$253,988	$87,274	$53,570	$1,633,879	$2,028,711
LINE F					
Annual trip length (miles)	3.804	0.536	0.997	12.331	13.168
Annual vehicle-miles of travel	2,160,415	458,652	934,798	11,577,133	15,130,998
Annual vehicle operating cost	$318,661	$87,144	$131,339	$1,523,551	$2,060,695

CONRAD C & S

SUMMARY OF ANNUAL CONSTRUCTION AND OPERATING COSTS

(Operating costs based on present traffic volumes)

Alternate "A"	Annual Construction Cost	$ 327,750
	Annual Operating Cost	1,995,741
	TOTAL	$2,323,491
Alternate "B"	Annual Construction Cost	$ 327,543
	Annual Operating Cost	1,990,232
	TOTAL	$2,317,775
Alternate "C"	Annual Construction Cost	$ 303,531
	Annual Operating Cost	2,012,173
	TOTAL	$2,315,704
Alternate "D"	Annual Construction Cost	$ 230,805
	Annual Operating Cost	2,035,321
	TOTAL	$2,266,126
Alternate "E"	Annual Construction Cost	$ 333,339
	Annual Operating Cost	2,028,711
	TOTAL	$2,362,050
Alternate "F"	Annual Construction Cost	$ 285,591
	Annual Operating Cost	2,060,695
	TOTAL	$2,346,286

TABLE "G"

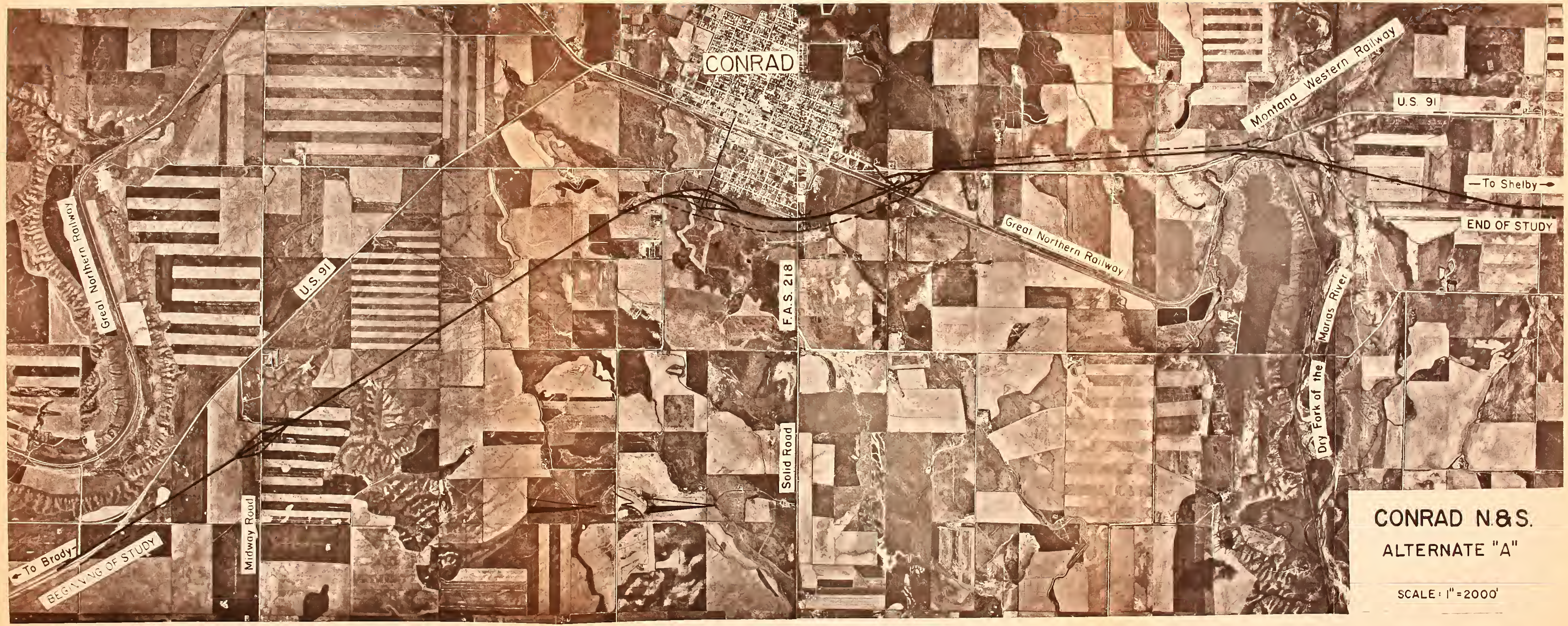
CONRAD N & S

SUMMARY OF ANNUAL CONSTRUCTION AND OPERATING COSTS

(Operating costs based on 1975 traffic volumes)

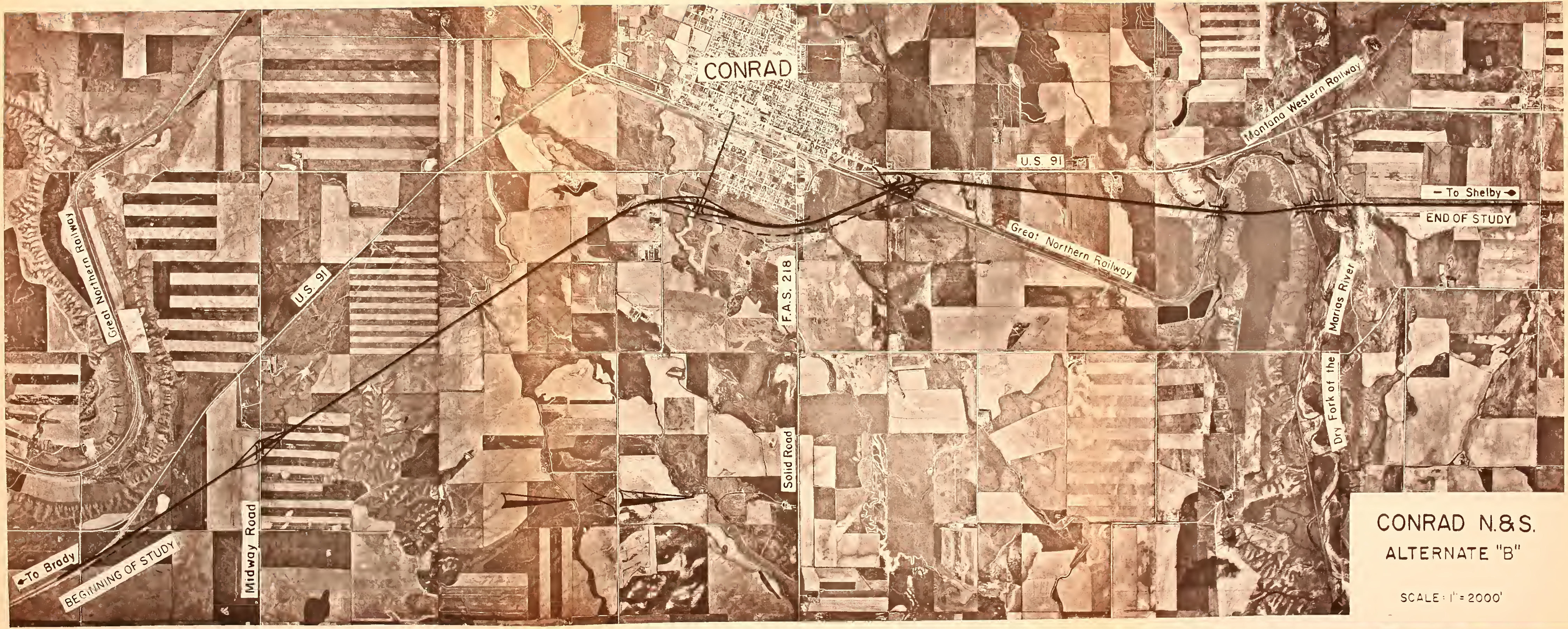
Alternate "A"	Annual Construction Cost	$ 327,750
	Annual Operating Cost	4,789,778
	TOTAL	$5,117,528
Alternate "B"	Annual Construction Cost	$ 327,543
	Annual Operating Cost	4,776,557
	TOTAL	$5,104,100
Alternate "C"	Annual Construction Cost	$ 303,531
	Annual Operating Cost	4,829,215
	TOTAL	$5,132,746
Alternate "D"	Annual Construction Cost	$ 230,805
	Annual Operating Cost	4,884,770
	TOTAL	$5,115,575
Alternate "E"	Annual Construction Cost	$ 333,339
	Annual Operating Cost	4,868,906
	TOTAL	$5,202,245
Alternate "F"	Annual Construction Cost	$ 285,591
	Annual Operating Cost	4,945,668
	TOTAL	$5,231,259

TABLE "H"



CONRAD N.&S.
ALTERNATE "A"

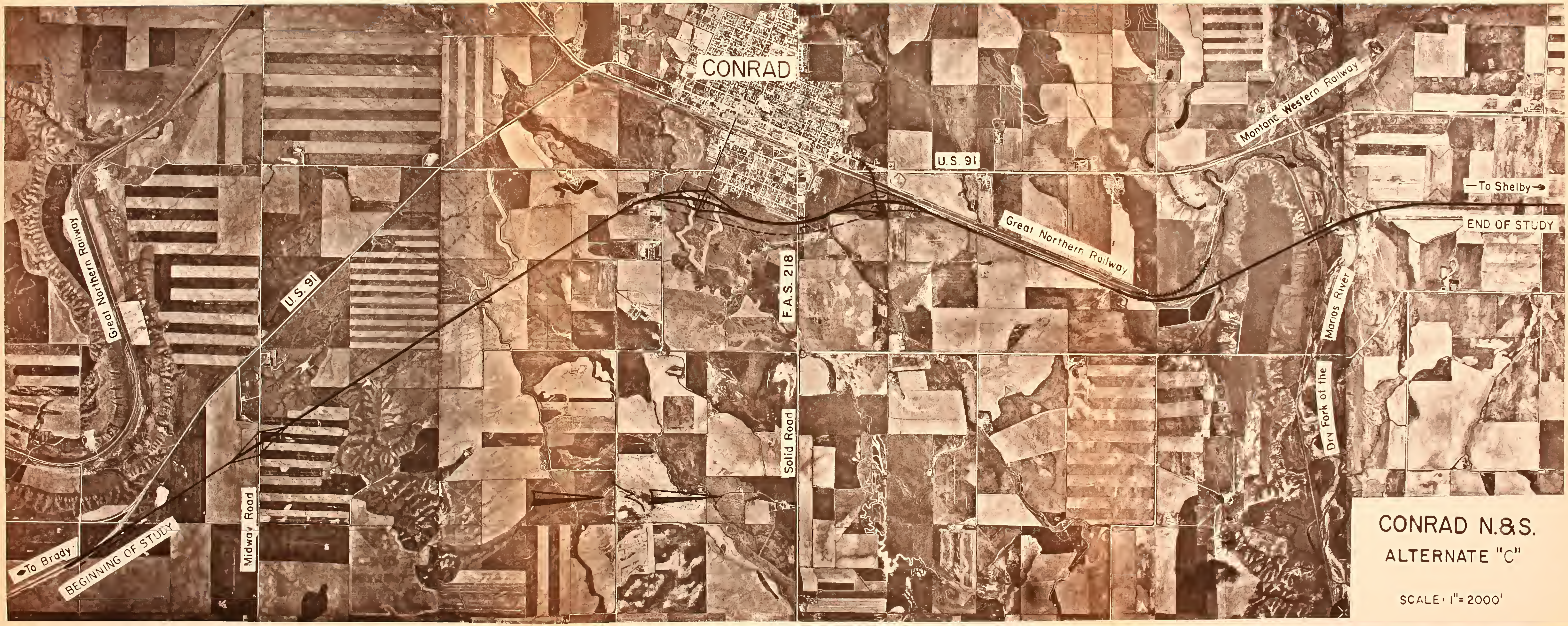
SCALE: 1"=2000'



CONRAD N.&S.

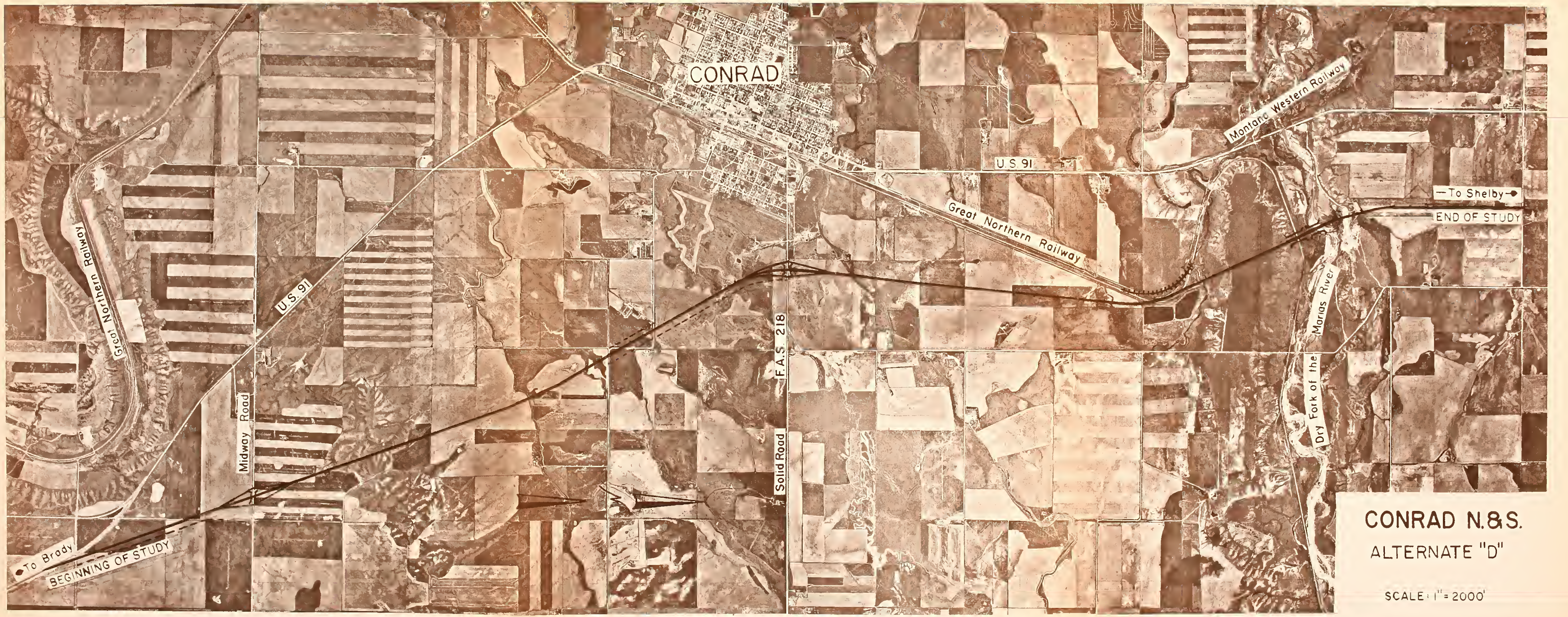
ALTERNATE "B"

SCALE: 1" = 2000'



CONRAD N.&S.
ALTERNATE "C"

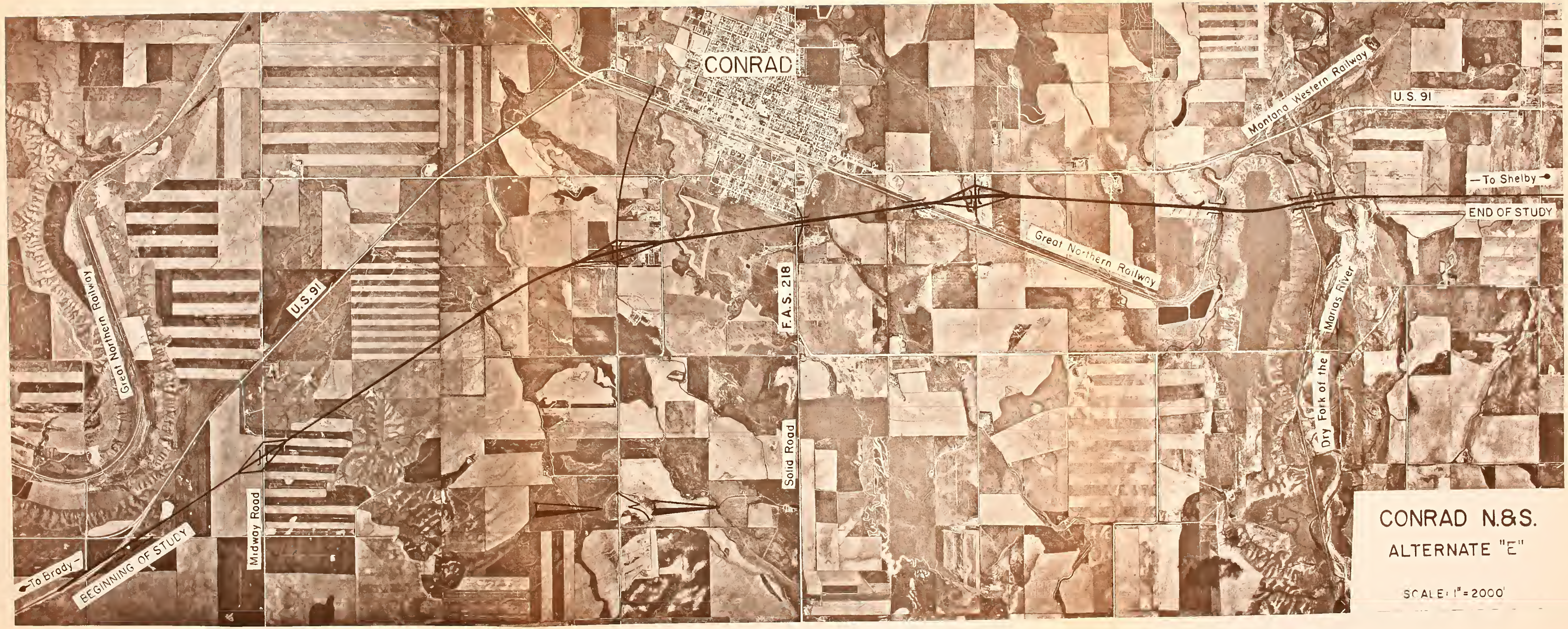
SCALE: 1"= 2000'



CONRAD N.&S.

ALTERNATE "D"

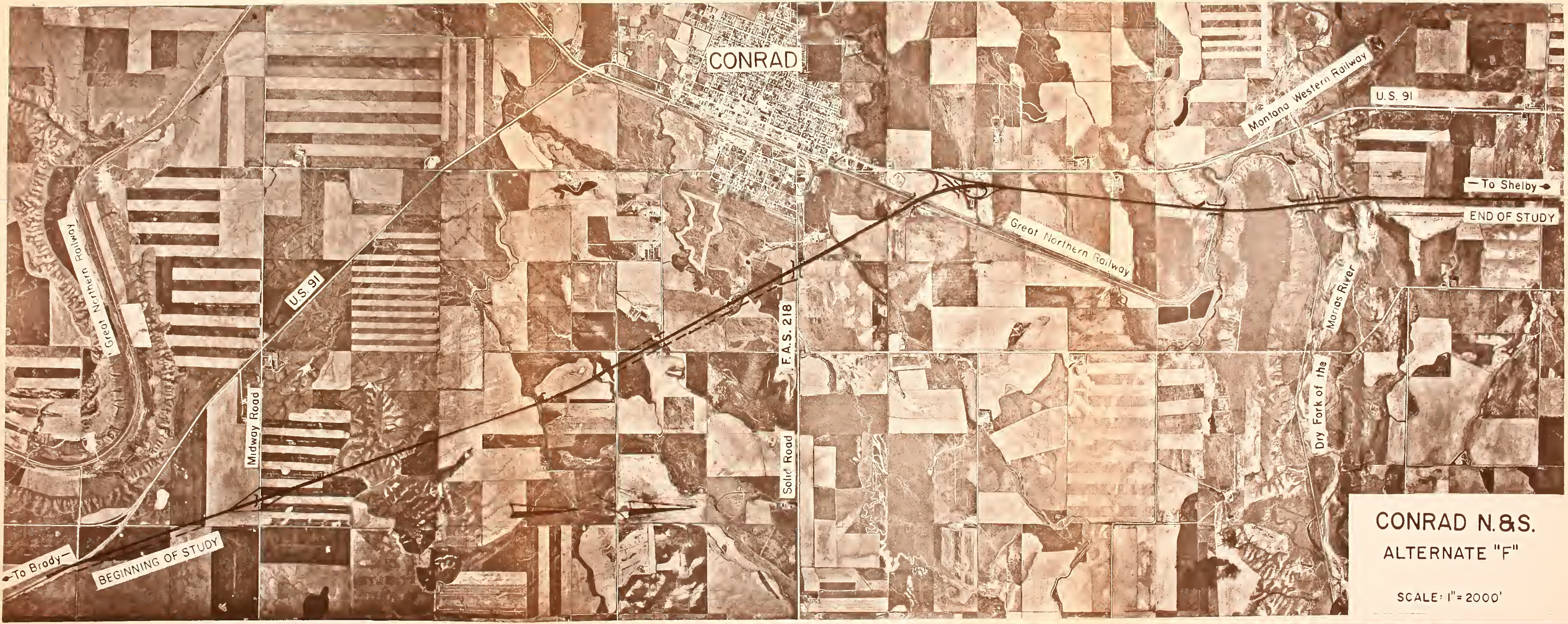
SCALE: 1" = 2000'



CONRAD N.&S.

ALTERNATE "E"

SCALE: 1" = 2000'



CONRAD N.&S.
ALTERNATE "F"

SCALE: 1"= 2000'

SUPPLEMENT

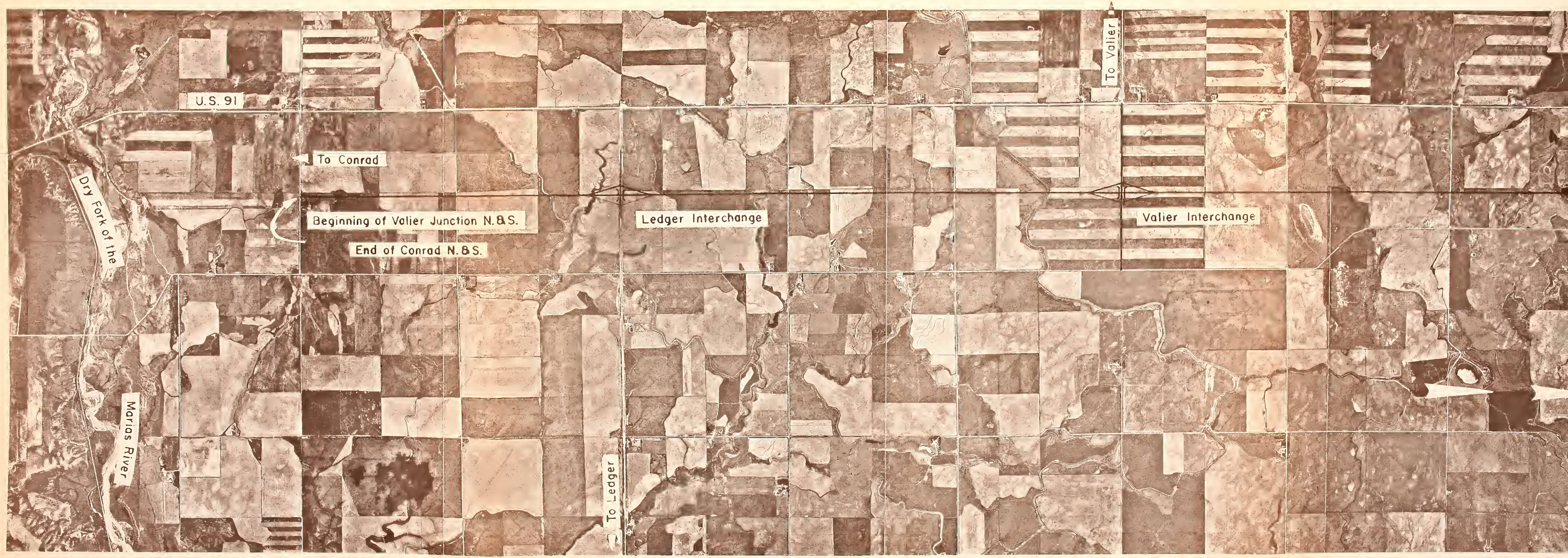
Valier Jct. N & S

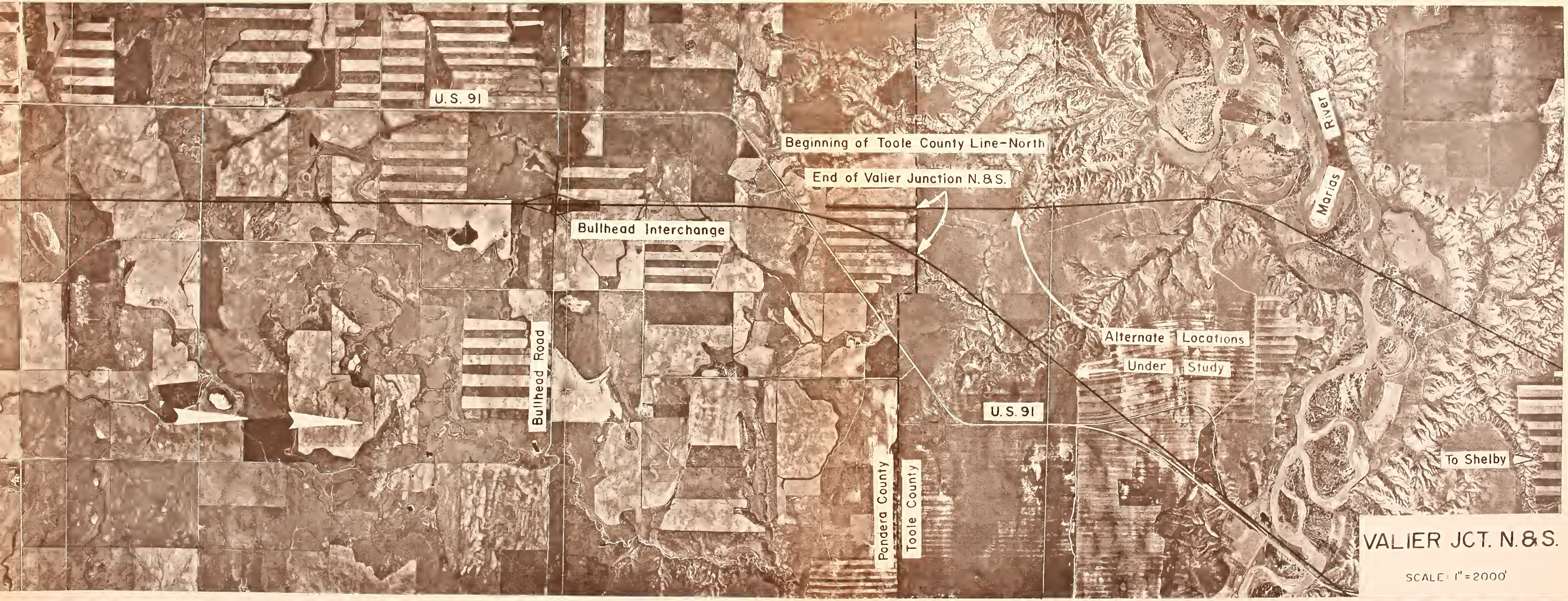
This supplement covers the proposed location of I 15 from approximately 4 miles north of Conrad northerly approximately 11 miles to the vicinity of the Pondera-Toole County Line.

The proposed location in this area follows along the center of section approximately ½ mile east of existing US 91. US 91 will serve as a frontage road on the west and a gravel county road will serve as a frontage road on the east. (This gravel road was once the main highway between Conrad and Shelby) This location was chosen as one which would do a minumum of damage to farm operations in the area.

Interchanges will be provided at the Ledger Road, the Valier Road and the Bullhead Road, as established by Commission action taken in May 1964.

A 1" = 2000'± aerial map is attached which shows the proposed location in this area.


U.S. 91
To Conrad
Dry Fork of the
Marias River
Beginning of Valier Junction N.&S.
End of Conrad N.&S.
Ledger Interchange
To Ledger
To Valier
Valier Interchange



VALIER JCT. N.&S.

SCALE: 1" = 2000'